word flow fits, then and only then does the sentence refer to the current. In practically every case, clearness can easily be achieved by changing a few verbs and prepositions. Some illustrations follow.

For "current *through* the wire" substitute "current *in* the wire"; particularly bad is "current through the circuit." "The direction the current flows" should be ' the direction of the current." "The current enters the coil" and "the current leaves the cell" contain unfortunate verb forms; these expressions are hardly subject to reconstruction and are so misleading that they should be abandoned.

"Furnish current," "send current," "force the current," "drive the current" are all misleading but can be corrected by using the verbs *maintain* or *set up*. "The current goes" and "the current flows" should be avoided by employing "the current is." It is not so easy to avoid "a current-bearing wire" and "a wire carrying a current." These are less serious and can be tolerated, *if* the much more objectionable phrases previously mentioned are not used.

The over-worked analogy of water flowing in pipes is frequently so used as to increase confusion, as, for example, when "the flow of current" is made analogous to "the flow of water." The analog of the water is the electricity, not the current. The resulting confusion sometimes persists in the minds of instructors, even after several years of puzzling over why students do not write good physics. But that it can be cleared up seems probable to the writer, who has never found a teacher unable to appreciate the dangers in the common and ambiguous uses of the word "current" or unwilling to attempt a correction of his own speech when the dangers were pointed out. Even a child, untutored in physics, upon hearing some of the foregoing quotations, remarked: "A current couldn't come to rest—it wouldn't be a current."

The teachers of physics certainly can be as careful as the kindergartner, who would never say to her pupils, "Every autumn the migration of the birds flies south," or "Every night the shepherd drives the movement of his sheep in from the hillside."

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Standing Waves by Reflection

THE writer finds little if any emphasis in the textbooks on the fact that waves coming from a nonreflecting point source may produce weak standing waves in front of a reflector at *nonselective* distances from the source, while a source which *reflects* the waves also, thus causing multiple reflections, produces more intense standing waves but only at distances selective as to the number of wavelengths included between the source and the nonvibrating reflector.

Unless the foregoing distinction is kept in mind the application of the various rules for constructing the component progressive waves and the resultant standing waves may lead to apparent contradictions. If the case of a whistle near a reflecting wall is under consideration, a beginner by applying such rules as the acoustic image rule or the cancelation wave and companion wave rule, might correctly conclude that a *node* will result at the wall as to *particle motion* but that the excess *pressures* combine *constructively*, regardless of the distance to the source. However, if he remembers the closed Kundt's tube experiment and the selectivity rules that apply to this case he may think that he has made a mistake in arriving at his *first* conclusion. He would find it an interesting exercise to draw the curves representing four or five wave trains due to the successive reflections as they would appear at different times thus satisfying himself that there is a decided difference between this case and the case of a single reflection.

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Recent Actions of the International Electrotechnical Commission in Reference to Electric and Magnetic Units

THE purpose of this communication is to give a brief statement of certain actions taken at Paris, in October, 1933, by the Committee on Electric and Magnetic Magnitudes and Units of the International Electrotechnical Commission. Matters of electrotechnical interest will be omitted, and consideration will be given only to actions of special interest to physicists. A full account of the proceedings appears in I.E.C. document R.M. 105, October, 1933. The actions taken are subject to revision by the various national committees of the I.E.C. before becoming confirmed.

The following modifications in c.g.s. magnetic formulas were recommended.

IN NONMAGNETIC MEDIUMS

(1) *Force* f between two like magnetic poles, each of strength m and separated by a distance of r cm:

$$f=m^2/\mu_0 r^2 \quad \text{instead of} \quad f=m^2/r^2.$$

(2) *Intensity of tractive force* f' or *Tension per square centimeter* exerted across an air gap or entrefer, between opposed parallel plane polar surfaces:

$$f'=B^2/8\pi\mu_0 \quad \text{instead of} \quad f'=B^2/8\pi.$$

(3) *Magnetic volume energy* w in free space carrying uniform flux density B *gauss* and magnetizing force H *oersteds:*

$$w=\frac{\mu_0 H^2}{8\pi}=\frac{HB}{8\pi}=\frac{B^2}{8\pi\mu_0} \quad \text{instead of} \quad w=\frac{H^2}{8\pi}=\frac{HB}{8\pi}=\frac{B^2}{8\pi}.$$

IN MAGNETIC MEDIUMS

(4) *Formula for uniform magnetization:*

$$B=\mu H=\mu_0 H+4\pi \boldsymbol{I} \quad \text{instead of} \quad B=\mu H=H+4\pi \boldsymbol{I},$$

where $\boldsymbol{I}$ is the uniform intensity of magnetization of the materials. If $\boldsymbol{I}=0$, $B=\mu_0 H$ instead of $B=H$.

(5) *Absolute permeability* μ:

$$\mu=\mu_0+4\pi\kappa, \quad \text{instead of} \quad \mu=1+4\pi\kappa.$$

(6) *Magnetic susceptibility* κ:

$$\kappa=(\mu-\mu_0)/4\pi \quad \text{instead of} \quad \kappa=(\mu-1)/4\pi.$$

As a result of the four I.E.C. meetings in 1927–1933, progress has been made in escaping from several decades of confusion in magnetic terminology, by adopting the *gauss* for the c.g.s. unit of flux density B and the *oersted*, or the *gilbert per centimeter*, for magnetizing force H. The recommendations were supported at the 1932 meeting of the International Union of Pure and Applied Physics.[1]

As regards the practical series of magnetic units one new name was recommended in 1933; namely, the *weber* for the practical unit of magnetic flux Φ, equal to 10^8 *maxwells*. The name *pramaxwell* had been recommended provisionally for this unit in 1930, together with the general use of the prefix *pra-* to distinguish a practical unit from the corresponding c.g.s. unit, when so desired; however, because of some dissatisfaction with this prefix, it was decided to refer the question of its retention to the national committees.

It was recommended that the series of nine practical units: *ampere, coulomb, farad, henry, joule, ohm, volt, watt* and *weber* should be considered for completion into a comprehensive absolute system, through the use of the meter, kilogram and second as fundamental units.

A. E. KENNELLY
Chairman of the E.M.M.U. Committee
Harvard University

[1] R. T. Glazebrook, National Research Council Bull. No. 93 (1933), pp. 4–7.

Program for the Physics Section of the S.P.E.E.

A SPECIAL program on the teaching of physics to engineering students will be presented on June 24 at the Georgia School of Technology, Atlanta, Georgia, in connection with the 43rd annual meeting of the Society for the Promotion of Engineering Education. The following program has been arranged by a committee of fifteen physicists appointed by the Society:

An Adventure in Teaching Physics to Engineering Students, K. H. Fussler, University of North Carolina; Physics Texts for Engineering Students, E. E. Bortell, Georgia School of Technology; Physics Courses for Junior and Senior Engineering Students, A. A. Bless, University of Florida; The Most Efficient Use of Time Spent in the Laboratory, Percy Hodge, Stevens Institute of Technology; The Use of the Computation Section, D. M. Bennett, University of Louisville; Physics the Engineer Should Know, O. W. Eschbach, American Telephone and Telegraph Co.; Aims and Objectives of Physics Teaching in Engineering Colleges, D. S. Elliott, Tulane University; The Physics Laboratory Report, G. E. Grantham, Cornell University.

Rooms in school dormitories will be provided for visitors.

G. E. GRANTHAM,
Chairman of Program Committee
Department of Physics,
Cornell University.

Reports of Committees of the American Association of Physics Teachers

Electric and Magnetic Units and Dimensions

1. As a result of a minor part of our study we recommend the more general use of the prefixes *micro* (μ), *milli* (m), *kilo* (K) and *mega* (M). In multiplying numbers by powers of 10 we would use only those powers of 10 that are also powers of 1000; for example, 10^3, 10^{-3}, 10^6. Thus we would write 10 megaergs/joule instead of 10^7 ergs/joule; Young's modulus for steel would appear as 2.1×10^{12} dynes/cm^2, or 2.1 megamegadynes/cm^2, rather than as 21×10^{11} dynes/cm^2. The committee disclaims any originality in this recommendation; it is already in successful use with certain units such as milliampere, microfarad, micromicrofarad, micrometer (micron) and millimicron. The Angstrom does not fit into the scheme. It is not intended, of course, to urge the use of these prefixes in places where they are inappropriate, as for example in expressing Planck's constant. Since a little consideration will convince one of the greater ease in remembering numbers if this plan is followed, it should receive wider attention; it is suggested that the editors of the several physics journals try to secure the permission of authors to make alterations which would be consistent with the plan.

2. In the principal part of our work on systems of units and dimensions, the findings are not completed, but certain general conclusions have been reached. It does not seem advisable to restrict usage to one system of electrical units, but it does seem that, of the half dozen or more systems in common use, two would best meet our needs. One of these would be either the Heaviside-Lorentz or the Gaussian system, and there seems to be considerable sentiment in favor of the *Gaussian;* they differ in the location of the 4π. This system would be for the advanced student and the theoretical physicist. The second system, for the beginner, the laboratory worker, and the engineer, would contain the ampere, ohm, volt, joule, watt, meter, etc. The extension of this *practical* system to include all electrical and mechanical quantities involves much less change and inconvenience than is commonly believed.

3. The subject of the dimensions of physical quantities is little understood by the average physicist; or it may be better to say, what one person means by dimensions may be quite different from what another means. The subject is controversial and philosophical. The number and choice of the primary quantities is quite arbitrary. In mechanics a